Health Consultation — McIntosh County

Andreleau Point Subdivision
May 27, 2009

Introduction
On October 22, 2008 a resident of the Andreleau Point subdivision called the McIntosh County Health Department and reported that a private drinking water well shared by three households was found to contain arsenic at levels exceeding the U.S. Environmental Protection Agency's (EPA) Safe Drinking Water Act criterion (reported result = 25 parts per billion [ppb]; EPA Maximum Contaminant Level = 10 ppb). In response, staff from the District and County Health Departments conducted well water and soil sampling and analyses.

Environmental Sampling
In October and November 2008, the McIntosh Health Department staff collected 14 water samples from the water well from both first draw (no flush), and then again after purging (minimum 300 gallon flush) the well. Samples were also collected from the tap at each house. After several days, two additional rounds of sampling were conducted at the well and household taps. Analyses results for all water samples (< 1 ppb) were well below state and federal regulatory and health based values.

On November 18, 2008, after speaking with the resident, three soil samples were collected from their home vegetable garden. The soil samples were used to screen an isolated area where household members were known to be active and in frequent contact with a potential pathway (soil) for arsenic exposure. This specific garden soil is irrigated with the same water source and contains imported soil amendments (e.g., manure). A total of three samples were collected from the garden: two soil composites from the soil and one grab sample from a small burn pit located inside the garden perimeter. One soil composite was collected from the furrows (garden base) and one from the windrows (worked/hilled soil). Each sample was comprised of nine sub-samples obtained at equidistant locations throughout the garden. The samples were collected from 0 - 3 inches below ground surface.

Results
Results for all soil samples were well below state regulatory values for arsenic in soil (20 parts per million [ppm]). Low levels of arsenic ranging from 0.7 to 1.0 ppm were found in the garden soil samples. The highest concentrations were associated with the small burn pit. All soil levels were below expected background (normal) levels for the Southeast United States.

Arsenic levels in the garden soil did, however, exceed the Agency for Toxic Substances and Disease Registry (ATSDR) Cancer Risk Evaluation Guideline (CREG) concentration of 0.5 ppm.

Resident(s) in the subdivision also reported that medical test results showed that some residents had elevated levels of arsenic in their urine. These test results were not provided to staff for review. McIntosh County Health Department staff recommended that all of the potentially exposed residents have additional medical testing to assess the levels and forms of arsenic in their urine.

Arsenic is found in two forms: inorganic and organic. The inorganic forms are more toxic than organic arsenic. Elevated organic arsenic levels in urine are common for people who consume fish and seafood. Urine is usually tested for total arsenic (inorganic and organic) coming from all sources—food, water, air, and soil. Total arsenic in urine is mostly the relatively nontoxic organic arsenic from food sources (80%*). Testing for both organic and inorganic arsenic separately is preferable to total arsenic testing in order to distinguish between exposure to the more toxic inorganic arsenic (found in water, air and soil) and its metabolites, and organic arsenic from food.

Conclusions
Based on the limited information obtained during this investigation, there appears to be ***no apparent public health hazard*** to residents from exposure to arsenic in drinking water and soil. There is no evidence to suggest that chronic exposure to arsenic at levels of health concern is occurring or will occur in the future.

Recommendations
If residents are concerned about arsenic exposure, they can consult with a health care professional for medical testing to determine if exposure to arsenic is presently occurring. If elevated levels of inorganic arsenic are found in urine, contact the County Health Department.